WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 20, 118-124. Review Article ISSN 2277–7105

BREAST CANCER TREATMENT AND IT'S COMPLICATIONS

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Article Received on
24 August 2024,

Revised on 14 Sept. 2024,
Accepted on 04 October 2024

DOI: 10.20959/wjpr202420-34120

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ABSTRACT

The majority of women treated today for breast cancer are long term survivors. The risk of developing breast cancer rises with increasing ages (especially elderly population of 80 years of age). Breast cancer treatment is based on stages, histology and biomarkers when breast cancer stage I and II are usually with breast conserving surgery and radiation therapy. Considered stage III is aggressively and requires induction chemotherapy rather than breast conserving surgery. Then breast cancer treatment has side effect includes as the long term and short term side effects of combined morality treatment have a significant role play on quality of life.

INTRODUCTION

Breast cancer is the most common cancer diagnosed in women and the second most common cause of death from cancer among women worldwide.[1] The breasts are paired glands of variable size and density that lie superficial to the pectoralis major muscle. They contain milk-producing cells arranged in lobules; multiple lobules are aggregated into lobes with interspersed fat. Milk and other secretions are produced in acini and extruded through lactiferous ducts that exit at the nipple. Breasts are anchored to the underlying muscular fascia by Cooper ligaments, which support the breast.[2]

Breast cancer most commonly arises in the ductal epithelium (ie, ductal carcinoma) but can also develop in the breast lobules (ie, lobular carcinoma). Several risk factors for breast cancer have been well described. In Western countries, screening programs have succeeded

in identifying most breast cancers through screening rather than due to symptoms. However, in much of the developing world, a breast mass or abnormal nipple discharge is often the presenting symptom.[3] Breast cancer is diagnosed through physical examination, breast imaging, and tissue biopsy. Treatment options include surgery, chemotherapy, radiation, hormonal therapy, and, more recently, immunotherapy. Factors such as histology, stage, tumor markers, and genetic abnormalities guide individualized treatment decisions.[1]

Cumulating data confirm the beneficial effect of radiotherapy in women with breast cancer. After mastectomy and breast conserving surgery, this effect is expressed by a significant decrease in the local relapse rate and, in the former, by increased survival, Postoperative radiotherapy, however, is associated with some complications that may affect patient quality of life and possibly survival.[4]

This review summary is the contemporary knowledge on morbidity and mortality related to breast –cancer radiotherapy, and provides possible means to decree se the incidence and severity of complications. As cardiovascular toxicity is covered by a separate paper in this issue, it will not be addressed here,

Etiology

Breast cancer development is important in general health screening for women.

1. **Age:** The age adjusted incidence of breast cancer to increase with the advancing age of the female population.
2. **Gender:** Mostly breast cancer occurs in females.
3. **Personal history of breast cancer:** A history of cancer is one breast increases the likelihood of a second primary cancer in the contralateral breasts.
4. **Histologic risk factors:** Histologic abnormalities diagonised by breast biopsy constitute. The abnormalities include lobular carcinoma insitu [LCIS] and proliferative changes with atypia.
5. **Family history of breast cancer:** Five percent to ten percent of all breast cancer cases are due to genetic factors. BRCA1 and BRCA2 are the two most important gens responsible for increased breast cancer.
6. **Reproductive risk factors:** Reproductive milestones that increases a women lifetime estrogen exposure are brought to increase.
7. **Exogenous hormones use:** The two most common scenario being contraception in premenopausal women and hormone replacement therapy.[5]

Epidemiology

According to the American Cancer Society (ACS), breast cancer rates among women from various racial and ethnic groups are as follows[6]

Non-Hispanic white: 128.1 in 100,000

African American: 124.3 in 100,000

Hispanic/Latina: 91.0 in 100,000

American Indian/Alaska Native: 91.9 in 100,000

Asian American/Pacific Islander: 88.3 in 100,000

Pathophyisiology

Most breast cancer is sporadic (90%-95%), with only 5% to 10% of patients having an identifiable genetic mutation.[7] BRCA 1 and 2 are the most common associated genetic conditions. Invasive ductal and invasive lobular carcinoma are the most common pathologic forms of invasive breast cancer. Carcinogenesis occurs due to a complex interplay of genetic and environmental risk factors, hormonal influences, and patient-related factors. The pathogenesis, treatment, and prognosis are closely associated with the following molecular subtypes of breast cancer:

Luminal A: Hormone receptor-positive, human epidermal growth factor receptor (HER)-2 negative

Luminal B: Hormone receptor-positive, HER-2 positive

Basal-like: Hormone receptor and HER-2 negative

HER-enriched: HER-2 positive, hormone receptor-negative

Hormone receptor-positive tumors (ie, luminal A and B) tend to be less aggressive, with improved survival rates.[8] HER-2 enriched tumors are more aggressive, with a poor prognosis without targeted therapy. In the era of targeted anti-HER therapy (eg, trastuzumab), the paradigm has shifted.[9] Basal-like tumors are negative for the molecular markers and tend to have a worse prognosis with poor survival rates.[10]

Complications can arise from the treatment

I. Surgical complications include

- Infection
- Pain
- Bleeding
- Cosmetic issues

- Permanent seassing.
- Alteration or loss of sensation in the chest area.

II. Chemotherapy complications includes

- Nausea/Vomitings
- Hair loss
- Memory loss (Chemo brain)
- Vaginal dryness
- Fertility issues
- Neuropathy

III. Complications accompanying hormonal therapy includes:

- Hot flashes
- Vaginal discharge dryness
- Fatigue
- Nausea
- Impotency in males with breast cancer

IV. Radiation complications includes:

- Pain and skin changes
- Fatigue
- Nausea
- Hair loss
- Heart and lung issues
- Neuropathy.[12]

Treatment of breast cancer

There are 5 types of therapies, they are:

1. **Surgery :** There are two major types of surgical procedure treatment of breast cancer they are

a. **Breast conserving surgery (BCS):** BCS is also called partial /segmental mastectomy. The removal of the cancerous tissue with simultaneous preservation of infant breast tissue often with plastic surgery technique it is called as oncoplasty.

b. **Mastectomy:** Mastectomy is a complete removal of the breast is associated with breast reconstrictions.

2. **Chemotherapy:** Chemotherapy is a systemic treatment of breast cancer.

Chemotherapy might also be used in the secondary breast cancer.

The choice of the proper drug is a major importance. Since different molecular breast cancer subtype respond to pre-operative chemotherapy. Pre-operative chemotherapy is comparably effect to post-operative chemotherapy.

3. **Radiation therapy:** Radio therapy is a local treatment of breast cancer. Typically provided after surgery on chemotherapy. It is performed to ensure that all the cancerous tissue is destroyed. Choice of the types of radiation therapy depends on previous type of surgery or specific clinical situation.

Regarding breast cancer specialized in several types are distinguished including:

- Intraoperative radiation therapy (IORT)
- 3D conformed radio therapy (3D-CRT)
- Intensity modulated radiotherapy(IMRT)

4. **Hormonal therapy:** Endocrine therapy might be used either or a neo adjuvant or adjuvant therapy in patients with luminal molecular subtype of breast cancer.

Endocrine therapy aims to lower the estrogen levels or prevent breast cancer cells.

Endocrinal therapy combined with chemotherapy is associated with reduction of mortality rate among the breast cancer patients.

5. **Biological therapy:** Biological therapy (Targeted therapy) can be provide at every stage of breast therapy. Biological therapy is quite common in HER2 positive breast cancer patients.

Major drugs include are-

Trastuzuemab, perfuzemab, lapatirib and neratirib.[13]

CONCLUSION

We have been concluding that the maximum very elderly patients can be safely treated with surgery and radiation in according to their stage of breast cancer. Treatment with surgery or radiation should be considered despite of age in order to affect local regional control.

Chemotherapy results in a significant incidence of complications should be carefully implemented in this age group. A prospective study (trial) is necessary to assess the aggressive multimodality therapy required specially in very elderly population.[14]

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